

Listing of and Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

91
Cont.

1. (Currently amended) A method of transmitting data in a borehole, the method comprising providing a first electric signal representative of the data to be transmitted, converting said first electric signal into a sonic signal at a first location closely adjacent one side of a physical obstruction in an internal bore of an elongate tubular member and propagating said sonic signal along said elongate tubular member from said first location to a second location closely adjacent a second side of said physical obstruction, wherein a distance between said first and second locations is short in comparison with a distance between said second location and a surface end of the borehole, converting said sonic signal into a second electric signal at said second location and storing said second electric signal for subsequent retrieval.

2. (Original) A method according to claim 1, in which the subsequent retrieval is effected by a pick-up tool lowered down the borehole to a location adjacent the obstruction.

3. (Original) A method according to claim 1, in which conversion from the electric signal to the sonic signal includes digital modulation of a carrier frequency in the range 100 Hz to 10 kHz.

4. (Original) A method according to claim 1, in which the sonic transmission is effected by longitudinal vibration.

5. (Original) A method according to claim 1, in which the elongate member is a drill stem, the obstruction is a shut-in valve in the drill stem, and the data comprises pressure-versus-time in the drill stem beneath the shut-in valve.

6. (Previously amended) Apparatus for transmitting data in a borehole, the apparatus comprising a transmitter and a receiver; the transmitter including means for converting data parameters into an electric signal and first transducer means responsive to said electric signal to generate an acoustic signal, the first transducer means being adapted for physical coupling to an elongate tubular member having an internal bore extending along the borehole whereby the acoustic signal is propagated in said elongate tubular member; the receiver comprising second transducer means adapted for physical coupling to said elongate tubular member to produce an electrical output corresponding to said acoustic signal, and signal processing means connected to receive said output and operative to process the data into a condition for onward transmission; characterised in that said signal processing means includes memory means for storing received data, and means for transferring data from the memory means to a pick-up tool lowered to an adjacent location in the borehole; and in that the apparatus is adapted for used in transmitting data from one side to the other of an obstruction blocking said internal bore of said elongate tubular member, the first transducer means being coupled, in use, to said tubular member at a first location closely adjacent said obstruction on said one side and the second transducer means being coupled, in use, to the elongate tubular member at a second location closely adjacent said obstruction on said other side.

7. (Canceled)

8. (Original) Apparatus according to claim 6, in which the first transducer means is a magnetostrictive transducer adapted to be mounted to the elongate member to produce longitudinal sonic vibrations in it.

9. (Previously amended) Apparatus according to claim 6, in which the data parameter converting means is a fluid pressure transducer for monitoring fluid pressure below said obstruction.

10. (Original) Apparatus according to claim 6, in which said second transducer means comprises a mechanical bandpass filter and a piezoactive element mounted in series on the elongate member.

11. (Original) Apparatus according to claim 6, in which the signal processing means includes electronic filter means.

12. (Original) Apparatus according to claim 6, in which the pick-up tool includes further memory means in which the data may be stored until the pick-up tool is returned to the surface.

13. (Original) Apparatus according to claim 6, in which the pick-up tool includes means for transmitting the data to the surface via a cable.
